**Introduction:**

An Enigma machine is any of a family of related [electro-mechanical](http://en.wikipedia.org/wiki/Electromechanics) [rotor cipher machines](http://en.wikipedia.org/wiki/Rotor_machine) used for the [encryption](http://en.wikipedia.org/wiki/Encryption) and decryption of secret messages. Enigma was invented by [German](http://en.wikipedia.org/wiki/Germans) engineer [Arthur Scherbius](http://en.wikipedia.org/wiki/Arthur_Scherbius) at the end of [World War I](http://en.wikipedia.org/wiki/World_War_I). Like other rotor machines, the Enigma machine is a combination of mechanical and electrical subsystems. The mechanical subsystem consists of a [keyboard](http://en.wikipedia.org/wiki/Alphanumeric_keyboard); a set of rotating disks called rotors arranged adjacently along a [spindle](http://en.wikipedia.org/wiki/Axle); and one of various stepping components to turn one or more of the rotors with each key press.

The Enigma transformation for each letter can be specified mathematically as a product of [permutations](http://en.wikipedia.org/wiki/Permutation). Assuming a three-rotor German Army/Air Force Enigma, let \scriptstyle U denote transformation that of the reflector, and \scriptstyle L, M, R denote those of the left, middle and right rotors respectively. Then the encryption \scriptstyle E can be expressed as

E= RMLUL-1M-1R-1

After each key press, the rotors turn, changing the transformation. For example, if the right hand rotor \scriptstyle Ris rotated \scriptstyle i positions, the transformation becomes \scriptstyle\rho^iR\rho^{-i}, where \scriptstyle\rhois the [cyclic permutation](http://en.wikipedia.org/wiki/Cyclic_permutation) mapping A to B, B to C, and so forth. Similarly, the middle and left-hand rotors can be represented as \scriptstyle j and \scriptstyle k rotations of \scriptstyle M and \scriptstyle L. The encryption transformation can then be described as



This project aims to emulate this electro-mechanical system using computer programming language and further introduction of reflector lead to severe conceptual flaw and a cryptological mistake subsequently exploited by code breakers but this emulation will solve this problem.

**Instructions:**

1. Open the project in Microsoft Visual Studio 2012 or later.

2. Place "icons" folder in "parent\_directory/div/icons".

3. Build the project.